CLAIMS

1. In a method of mechanically mixing and dispersing a paste material and a low-pressure gas to produce an expandable material, followed by discharging and expanding the expandable material to produce a cured product,

wherein the improvement comprises using as the paste material a one-pack type curing paste material having viscosity characteristics included in the zone defined by points A, B, C and D in the graph of Fig. 1 showing the relationship between shear rate and apparent viscosity, said points A and B being at 50-30000 poises of an apparent viscosity (measured by a Brookfield rotary viscometer using spindle No.7, at 2 rpm, at 20°C) in low shear rate region (0.43 sec^{-1}) and said points C and D being at 20-2000 poises of an apparent viscosity (measured by an apparent viscosity meter according to JIS K2220, at 20°C) in high shear rate region (783 sec^{-1}), and mechanically mixing and dispersing the one-pack type curing material and a low-pressure gas, followed by discharging and expanding the resulting expandable material to produce a cured product with dense uniform closed-cells.

2. The discharging and expanding method according to claim 1,

wherein the method of mechanically mixing and dispersing a one-pack type curing paste material and a low-pressure gas to produce an expandable material comprises

supplying the low-pressure gas into a cylinder during and/or after a suction stroke of a piston pump which is reciprocated in the cylinder to carry out suction stroke and discharge stroke, then

supplying the one-pack type curing paste material into the cylinder by batch process,

carrying out the discharge stroke by using the piston pump after supplying the one-pack type curing paste material, and

discharging the low-pressure gas and the one-pack type curing paste material to a pipe in the discharge stroke.

3. The discharging and expanding method according to claim 1 or 2, wherein the method of producing an expandable material and discharging and expanding the expandable material is carried out by using a mechanical foaming apparatus comprising,

a piston pump including a piston and a cylinder, in which the piston is adapted to reciprocally move within the cylinder to effect suction stroke and discharge stroke;

a gas supplying device for supplying a low-pressure gas into the cylinder under a predetermined pressure;

a paste material supplying device for supplying a one-pack type curing paste material into the cylinder under a predetermined pressure;

a control device for effecting control to supply the low-pressure gas into the cylinder during and/or after the suction stroke of the piston pump, supply the one-pack type curing paste material into the cylinder, effect the discharge stroke of the piston pump after the supplying stroke of the one-pack type curing paste material, and discharge the low-pressure gas and the one-pack type curing paste material into a pipe; and

a discharge device for discharging and expanding the expandable material into the pipe by connecting the pipe of the expandable material obtained from the control device.

4. The discharging and expanding method according to one of claims 1 to 3,
wherein the expandable material is adapted for a sealant, an adhesive, a coating material , a gasket, a packing, a cushion, an insulator, and/or a foamed molded material.

5. A one-pack type curing paste material to be used in the discharging and expanding method according to one of claims 1 to 4, which have viscosity characteristics included in the zone defined by points A, B, C and D in the graph of

Fig. 1 showing the relationship between shear rate and apparent viscosity, said points A and B being at 50-30000 poises of an apparent viscosity (measured by a Brookfield rotary viscometer using spindle No.7, at 2 rpm, at 20°C) in low shear rate region (0.43 sec^{-1}) and said points C and D being at 20-2000 poises of an apparent viscosity (measured by an apparent viscosity meter according to JIS K2220, at 20°C) in high shear rate region (783 sec^{-1}).

6. The one-pack type curing paste material according to claim 5, wherein the material is a moisture-curable type, a thermosetting type, a hotmelt type, a sol-gel type, a vulcanization-crosslinking type, and/or a photo/radiation-curable type, comprising silicones, polyurethanes, epoxies, synthetic rubbers, polyolefins, polyesters, acrylic resins, poly(vinyl chlorides), thermoplastics, thermoplastic elastomes.